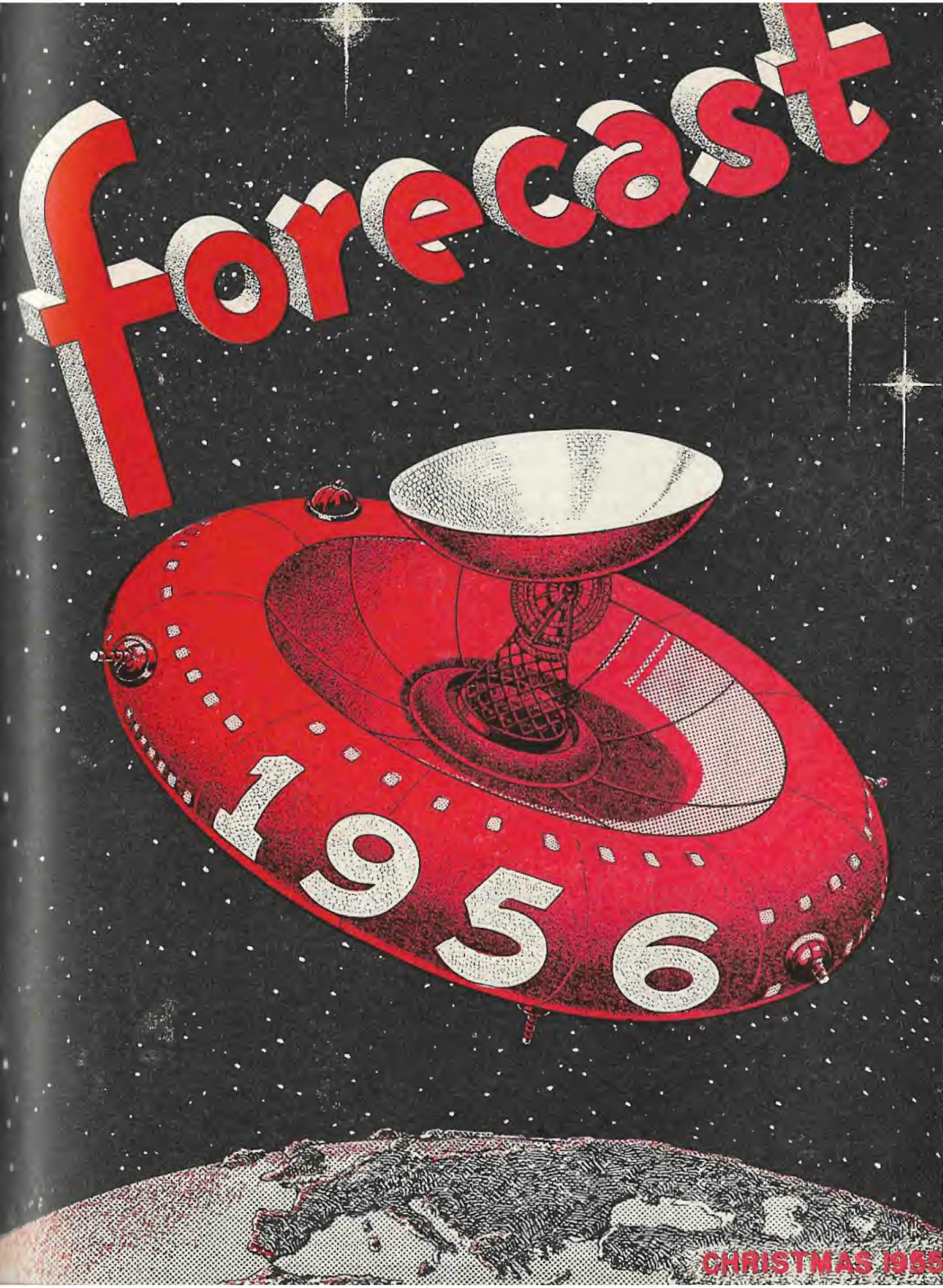
forecast
1956
CHRISTMAS 1955

PUBLISHER'S PAGE

NOT so long ago a writer who was interviewing me asked: "How do you think up all those ideas you put into your annual Christmas booklets?" My reply: "When you can tell me *exactly* what processes went on in your brain *before* you asked your question, you will have the answer!"

What are thoughts? Says Benjamin Disraeli, Earl of Beaconsfield: "Experience is the child of thought, and thought is the child of action." Or, as Marcus Aurelius put it some 1780 years ago: "The Universe is change; our life is what our thoughts make it."

If this does not give us a complete answer about our thinking processes, let us not despair; philosophers past and present, down to Einstein have tried to unravel the enigma of conscious thought but have made little progress so far. For that quality which makes man what he is—thinking—is an intangible tenuous will-o'-the-wisp that eludes him completely. During most of our lives we think as involuntarily as we breathe. Yet it is certain that all thoughts spring from past experience—outside impressions accumulated since birth, which we store away, assort, integrate and withdraw as needed. But exactly how all this is done, and the biomechanics of it, are another and far more complex problem which I shall not even attempt trying to solve.

What actually brought on these ponderous unseasonal thoughts? Oh, yes, somewhere in the dark recesses of my subconscious I was *thinking* about YOU, really. *That* brought it on! And what were these elaborate thinking processes?

There was a surging urge to clasp your invisible hand and shake it sincerely as I have for these past 47 years and convey to you my perennial and heartfelt wishes for 1956, plus

A Very Joyous Christmas

And a Happy and Prosperous New Year

HUGO GERNSBACK

Despite it All, Your Editor and Publisher Since 1908,
25 West Broadway, New York

RADIO-ELECTRONICS MAGAZINE — GERNSBACK LIBRARY

SEXOLOGY MAGAZINE — SEXOLOGIA MAGAZINE (in Spanish)

Entire contents originated and written by Hugo Gernsback

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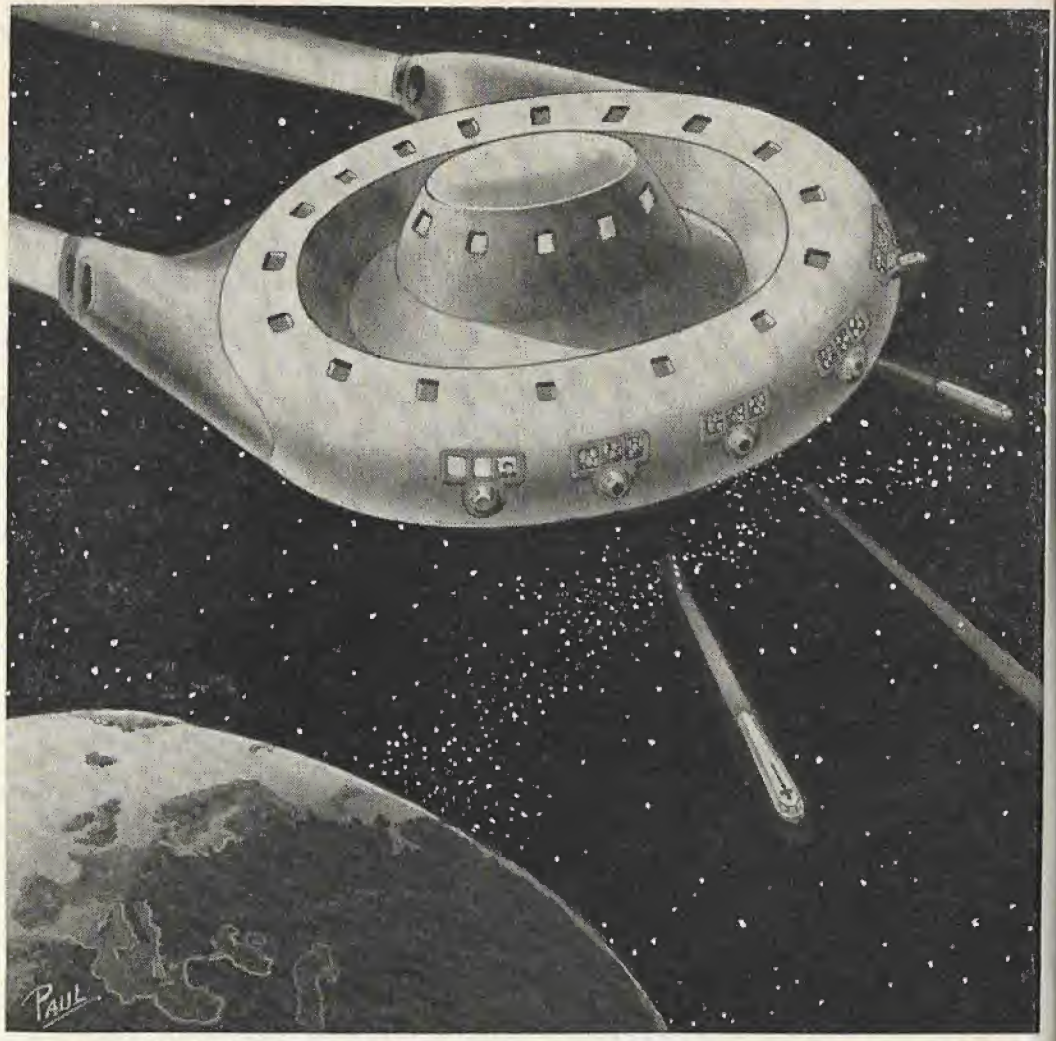
Art work by Frank Paul

STAR OF PEACE

As mankind grows up, its hunger for the supreme exploration—outer space—becomes intolerable. Chained since the existence of the race to the Earth's surface at the bottom of the air ocean, man longs to soar far above his stuffy atmosphere into *pure* sunlight. By 1958 the U. S. Government will have launched 6 to 10 satellites the size of basketballs, gravitating from 200 to 700 miles above the Earth. Other much more ambitious *manned* satellites will soon follow. Our cover depicts a future exploration satellite gravitating 1000 miles above the Earth, which it circles in 119 minutes, or 2 hours. It carries from 10 to 15 scientists and technicians for the sole purpose of unraveling the mysteries of the Universe. The saucer-shaped top object has thousands of the recently invented solar electro-cells which convert sunlight *directly* into electricity. It supplies *all* electrical power for the satellite. (The satellite, after launching, requires no propelling power as it speeds at 4.39 miles a second around our Earth.) The solar electric generator automatically turns into the sun as long as it is visible. In the Earth's shadow, storage batteries take over, which the generator charges during sunlight. The 5 objects projecting from the ship are not guns but astronomical special telescopes which will enrich man's knowledge of the heavens immensely—particularly solar and star research. This speeding Space Laboratory too will solve most weather problems, help radio and television research, unravel cosmic ray riddles, solve light propagation, outer space temperature and radiation problems.

HUGO GERNSBACK

Text for Our Cover



Coffins with their frozen bodies are here seen ejected from a future atomic space ship far from the earth. They will never return, speeding forever.

ONE of the most curious customs of the human race is the survival of prehistoric funeral rites. One can readily understand such customs in savage tribes and in those civilizations, such as the ancient Egyptians, which believed in reincarnation.

Yet modern man still largely clings to the barbaric ritual, chiefly because of vanity. The rich continue to desire pomp and ceremony at their funerals. Expensive bronze coffins, mausoleums that cost young fortunes, are the order of the day. Destitute widows squander the major part of the husband's insurance

A *literal* way how to go to heaven.

money for a sumptuous funeral with all the trimmings—or worse, go into years of degrading debt if there is no money or insurance.

All this, however, is a minor aspect of the barbarism. It is bad

SPACE FUNERALS

enough to lose a beloved member of one's family. Why torture the surviving relatives with long and extended funerary ceremonies with their heart-rending eulogies? In addition, the relatives, for endless years, must pay frequent visits to the deceased's grave, with the attendant heartaches—often to the detriment of their own health. What does this accomplish for the survivors?

Worse yet, with the rapid increase in the world's population, cemeteries *must* also increase in area. Cemeteries have become a serious problem because of lack of space in expanding metropolitan areas. Even today, cemetery plots are often too expensive for most people, due to the constant increase in that type of real estate value.

● Cremation would seem to be a ready answer to some of these problems; but, while crematories are on the increase in the U. S. and elsewhere, the percentage of cremations still is very small compared to burials. Then, too, we must not forget that there are always *a great many burials of the cremation ashes.* It is the custom of nearly all crematories to keep the ashes of

the deceased for the family. Unless the deceased has actually willed the disposal of his ashes, the survivors usually claim the urn containing the ashes and arrange for their burial. This naturally calls for a plot in the cemetery.

Nor are cremations popular with the religious and the devout. A number of religions prohibit cremation of the members of their faiths. This is true not only in the U. S., but in much of the entire world.

It takes no mathematician to calculate that we must soon reach a state where—with the rapid increase of the world's population—it just will be impossible to find sufficient cemeteries in the environs of our cities. Even the present wilderness regions far removed from urban centers will no longer be wastelands in the foreseeable future. Neither will today's deserts.

● Shall we bury our dead on top of the graves of those who died several generations ago? It was done frequently in ancient Palestine, Rome and elsewhere. This, in time, would create impossibly high burial grounds with treacherous foundations. Should we excavate huge caves for our burial grounds and stack our dead in five to ten tiers, as did the early Christians in the Roman Catacombs? At the excessively high cost of today's and future labor, I do not think that such a plan is, or will ever be, practical.

Sea burials would seem ideal, if there were no objection from religious organizations. The body, placed in a metal or cement casket, could be taken far out to sea and consigned to the ocean. Unfortunately, sea water is a rather violent chemical. The casket would not last long, nor would the deceased. In this respect a ground burial would be preferable. While such a funeral might be less costly (there is no burial plot) for those living near the coasts, the price would become excessively high for inland dwellers, due to the steep costs of transporting both deceased and the survivors who would want to attend the funeral in person.

● This brings me to a rather revolutionary plan with which I have occupied myself for some years. I wish to state here in all seriousness that this is NOT science fiction. Nor am I writing with tongue in cheek; but I am dead serious about the present project because I do believe that my plan solves most objections to present-day and future funerals.

I appreciate in advance that, as has too frequently happened in the past with dozens of my predictions—which are commonplace today—I shall be ridiculed in this, my latest proposal. All I can say to this is that I have been in the habit of sticking my neck out for over 50 years and I've usually had the last laugh!

As it is quite certain that funerals of humans will go on for thousands of years to come, despite all objections that can be brought forward against them, and as it is equally certain that we must soon run out of available cemetery space, there remains one solution which is bound to become popular in the future —*Space Funerals.*

If man, in his boundless vanity, wants to be *everlasting* or at least not disintegrate for millions or even billions of years, he now has that chance!

● *For the first time since the beginning of the human race, man now can, at long last, go to "heaven"—literally!*

(Let me digress at this point and state that in 1953 I participated with 65 scientists and space-flight authorities in a nation-wide symposium at which we gave our opinions as to when the first space flight to the moon would take place. My guess was 1970 for unmanned and 1980 for manned flight.)

With the world's first space satellite now actually being built by the U. S. Government, it is certain that *manned* space flight is coming in the foreseeable future, probably *before* 1980.*

The large space vehicles of the future will be atom-powered, not rocket-propelled like the pioneer flyers now in the blueprint stage.

Space flight can originate from present-day airports after certain alterations have been made; that is to say, such atomic space flyers can take off into outer space from *any* part of the world.

● We will then have specialized *funerary space ships,* which will leave city airports—or spaceports—on regular schedules which, depending on the size of the city, may be daily, semi-weekly or weekly. Each funerary ship may carry 50 or more coffins for space-burial. (It probably will not pay to carry less.)

The casket can be of light-gauge metal or thin reinforced cement, plastic or specially treated wood. After death and medical examination, *the body is placed in a deep freeze.* Embalming will be unnecessary.

The funeral ceremony can take

*By 1958, 6 to 10 space satellites will have been launched, according to Prof. Homer E. Newell of the U. S. Naval Research Laboratory and Dr. Jos. Kaplan, chairman of U. S. National Committee, of International Geophysic Year.

place either on earth in the usual funeral home, church or chapel, as at present or, if the family can afford the expense, the service can be held in the space ship far out in space.

In either case, the casket is placed along with others in the ship's deep-freeze gallery. The funerary ship now takes off from earth and speeds out into empty space. The outward and return trip may last anywhere from 10 hours to 24 hours, depending upon the season and the position of the moon and planets, as well as the maximum speed of the space ship.

● *The important consideration of every space burial is that each casket with its body must travel away from our planetary system,* NEVER TO RETURN.

One could, of course, release a casket a few thousand miles above the earth. At its correct speed, the casket then would become an eternal moon or satellite, circling the earth forever. But if this were done routinely, millions of such caskets would soon become a great hazard to space flying, hence it would never be attempted.

Now, the laws of gravitation and space mechanics state that, given sufficient speed, a body released in the direction opposite to the sun will continue to travel *away* from our planetary system into outer space, never to return. If not intercepted by another object—which is quite unlikely—the body will continue its flight for millions and even billions of years, passing out of our own universe into the uncharted depths of the infinite void.

But let us return to our funeral ship. The assembled family, after hearing the eulogy, now witnesses the final funerary act. The casket with their beloved has been briefly transported to the chapel on a moving belt from the deep-freeze gallery. The frozen corpse with its face visible looks exactly like an embalmed body through the coffin's opening. This is now closed and the casket moves on its belt to the *expulsion tube.* Here it passes through an air lock which has also a powerful spring in the rear door. This stout metal door has a piston that compresses the spring against the rear of the casket.

● At a signal in the chapel, a lever is pulled which opens the expulsion tube's outside door. The casket, pushed by the spring, *now leaps forward into outer space and into eternity.*

During the funeral service, the space ship has speeded up to its maximum velocity in the direction away from the sun. Hence, the casket assumes the same speed, plus the extra 10 or 20 miles given to it by the compression spring.*

The family, stationed above the ejection tube, witnesses the flight of the casket as it speeds ahead to be lost to view in a few seconds. (The space ship is already decelerating or turning in a new direction to release other coffins.)

The caskets will be painted white to reflect sunlight and heat rays. They travel in the nearly perfect vacuum of outer space and move in a temperature of some degrees above absolute zero. Already far from the sun, the casket, well refrigerated before it left the space ship, will not heat up appreciably from the sun's rays. Consequently, the deceased will remain frozen for eons. *Nor can the body decompose.* This would seem a worthwhile attraction for those people—millions of them—who have a horror of their bodies disintegrating.

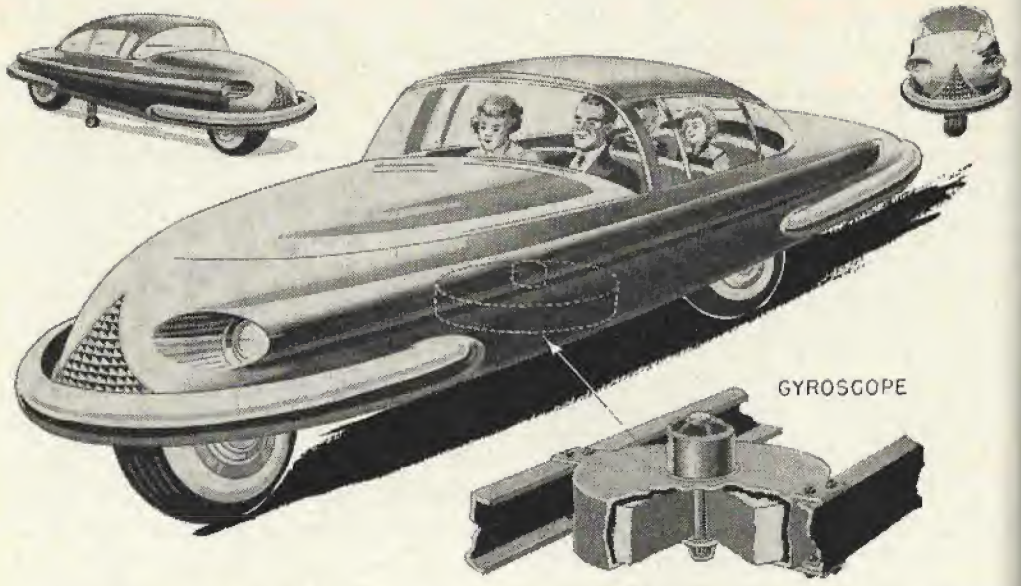
● Is there any likelihood of the billions of caskets released into free space through the centuries colliding with each other? About the same chance as pieces of confetti released from two different bags, one high over the Atlantic and the other over the Pacific. The chances, mathematicians tell us, are almost nil.

● Yes, if one wishes for near-*eternal existence,* space burial comes very close to it.

*Dr. Donald H. Menzel, director of the Harvard College Observatory, was kind enough to read the proofs of this article. He states the funeral ship should take off in a direction parallel to the earth's orbit. As the velocity of the earth in its orbit is 18½ miles a second, we must add 9½ miles a second to the ship's speed, which is not an extravagant figure in his opinion. This would give a total speed of 28 miles a second, sufficient for the caskets to leave the solar system, never to return.

TO OUR READERS

FORECAST 1956—like its many other predecessors—is the annual Christmas Card of publisher HUGO GERNSBACK. Over 7,000 copies have been printed for the publisher's friends in and out of the radio, electronic and television industry. Please do not send money for extra copies—the booklet is NOT for sale. Requests for single copies of FORECAST 1956 can be filled only as long as the present supply lasts. Quantity orders cannot be accommodated.



The thin 2-wheel Gyro Car, half as wide as present cars, keeps upright by gyroscope. Seats 4 people. Takes only half the space. When car is parked, 2 small center wheels descend. Lighter weight uses less gas.

The following is from an address (condensed) by Hugo Gernsback given before *The Engineering Society of Detroit*, June 8, 1955.

NEW ideas—particularly revolutionary ones—have never been popular with humanity. They upset us, bewilder us, and, if they interfere with our habits and our earnings, make us downright belligerent—at least till we become reconciled to the new.

I am only too well aware of all this, because for over 50 years I have been a rather constant purveyor of new ideas; and I am happy to state, I have frequently, in the past, made myself thoroughly unpopular in many quarters—*FOR A TIME.*

I am fully aware of the fact that some of my proposals may sound preposterous to many of you. When I published the first technical description of radar in 1911, it also sounded insane—or worse—but it was fully realized 28 years later.

future TRANSPORTATION

I therefore trust that you will bear with me and remember that my projects are really *forecasts for the future,* some of them for the more distant future.

I do insist that they are all scientifically and technically feasible. Whether or not they will prove economical or practical is another question which only time will answer.

● Let us start with THE major problem and current headache—*automobile congestion,* particularly in our larger cities. Not one of the remedies suggested has so far been of any value. Parking lots above or below the surface are wholly inadequate. Banning cars—particularly out-of-town cars—from cities is politically and economically unfeasible; no mayor would risk his future on such a measure.

● It seems to me that the automobile makers hold the key to the problem—now, as well as in the future. The remedy I propose is not a cure-all, but rather a stopgap—a breathing spell for our present intolerable car congestion problem. *By its means, we can gain over 40% more space in the streets and roads.*

The answer does not lie in the small type European car—Americans just won't buy them universally. The somewhat radical proposal is a present-day car sliced longitudinally in half—*a THIN 2-WHEEL GYRO CAR.* The new car will look exactly as do present-day cars from the side. But from the front it will look like a thin and sleek greyhound. In most other respects, it will remain the same as today's cars. Gyroscopic vehicles are no novelty; but the *thin* space-saving, 2-wheel *large* car is a challenge to our present overcrowded streets.

● The *gyro car* will also cost less to build, as it will use roughly 40% fewer materials and, therefore, will be sold more cheaply.

Why use a wide car anyway in this day of fearful congestion in our cities? Look at statistics in

large cities, like, for instance, New York. What is the average passenger-per-car density? *1¼ passengers!* Does this traffic justify 100%, five or seven passenger cars in our cities? Yet the proposed thin car will still accommodate four adults, an ideal family automobile.

First and foremost, the *Thin Gyro Car* is the answer to our present near-impassable and congested city streets. It is *the* car to squeeze through heavy traffic, to decrease the parking nuisance by almost half, the ideal taxicab to get to your destination quickly. It is also a natural as an *extra* car for the physician, the businessman and salesman, most of whom almost always travel alone. The catalog of advantages for the *Thin Car* is large. I will therefore not tire you with a lengthy list.

● Why do I insist on a *2-wheel gyro car?* A thin car with 4 wheels would be too clumsy and dangerous in taking curves at even a medium speed. A three-wheel thin car would have similar disadvantages. The *2-wheel gyro car* is ideal from a technical standpoint. With a gyroscope, the car cannot possibly topple even when taking curves at high speed. With the technical perfection of gyroscopes today, a 4-wheel thin car would be an anachronism.

The high speed gyroscope required for the thin car runs in a vacuum for greater efficiency. It can never get water-logged. The vacuum is constantly maintained by a small pump operated by the car's engine, which, of course, drives the gyroscope, either directly or electrically.

As long as the gyroscope spins, the car cannot tip over. If the gyroscope slows down to where it loses its gyro action, two small side-wheels—one on each side under the center of the car—descend automatically, safeguarding the car against toppling. These small auxiliary wheels are, of course, also necessary during parking.

Within seconds after starting the car's engine, the gyroscope functions and the car takes to the road. The auxiliary wheels have automatically retracted by that time. For better cushioned riding of the 2-wheel car, the tires should be wider than present-day ones—experience will dictate the best width.

● Will the *Thin Gyro Car* make the present-day cars obsolete? Of course not. The wide 4-wheel car has its own uses, particularly in the country. It will always be the big comfortable family car.

I am aware of the fact that a more or less revolutionary proposal, such as this, will create a number of new engineering problems. But I am certain that none of these are unsurmountable or even serious. They are, in the main, the same problems that are encountered in designing any new model of a modern car. The attractive point to auto makers, however, is that *for the first time the industry will have contributed a major solution of the traffic problem.* Furthermore, the auto manufacturers will have a distinctly *new* and outstanding car, a *new* item of manufacture, an extra car for a *new* market.

● Let us now turn our attention to the more distant future, with respect to automotive transportation, namely the self-propelled passenger car.

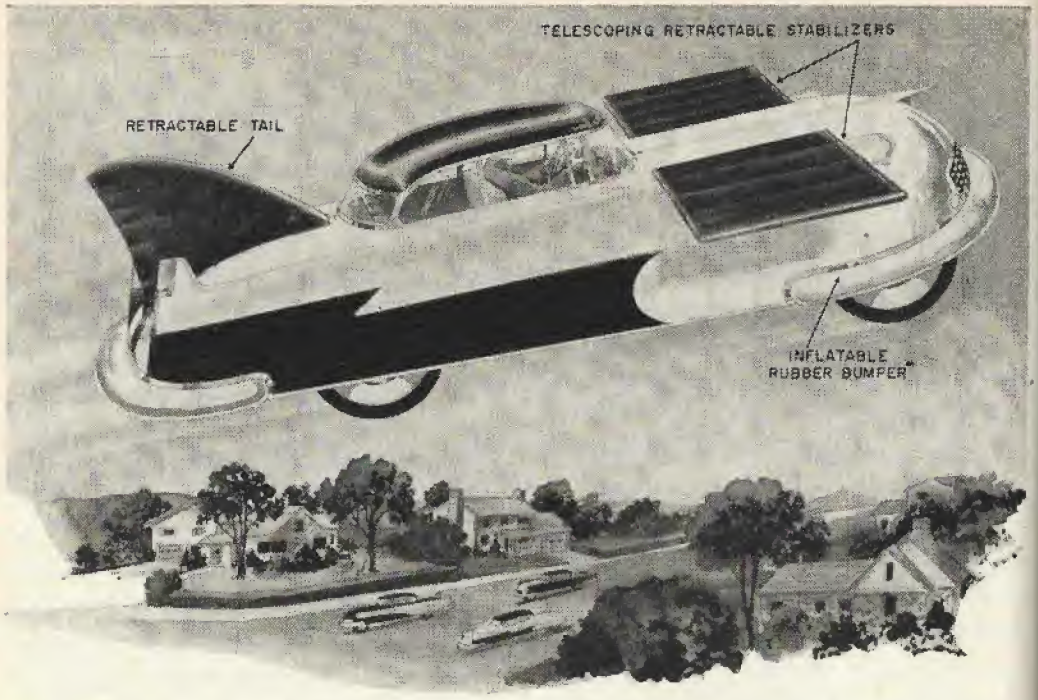
Here I would like to make the observation that the man who accurately predicted the submarine, the long distance aerial balloon, and dozens of other inventions, now commonplace — the great master forecaster, Jules Verne, while in his prime, never visualized the automobile or even anything that came close to it!

Let us first look soberly at the present-day automotive transportation problem and speculate what its future evolution will be. We know that it is impractical and economically impossible to rebuild our cities' streets to accommodate the future growth of traffic. Occasional underground parking lots are only a short-term solution.

● Can we ban all private cars from our cities, relying entirely on street cars, subways, buses, and taxis? From long experience, we know that this is not a solution. Can we forbid all private cars from parking anywhere on our fearfully congested streets? The counter question—wholly unanswerable—is: *Where* would you then park these millions of cars?

Meanwhile, the national population keeps increasing. We have 162 million people now. Soon there will be 200 million — at least our children will live to see it. Then we will have dozens of millions more cars than we have now.

● What will happen to future automotive traffic? Will it come to a gradual stop, choked by its own numbers, not to move again as has often been predicted? I think not. Human ingenuity does not evolve in this manner. Let's see what happened in our large cities when financial and economic pressure inexorably raised the value of our choice real estate to fantastic prices. The buildings on



Future flying car can rise from city streets by Counter Gravitational Field. Has retractable wings and tail which slide into car body. It's atom-powered. As the car is practically weightless it can easily be propelled either by compressed air or small electrical propellers concealed in the rear of car.

such valuable plots took to the sky! Our skyscrapers and high buildings became the only practical alternative.

It seems to me that a very similar solution must, of necessity, be the answer to our automotive traffic — *IT MUST EVENTUALLY TAKE TO THE SKY!* There seems no other logical answer in sight.

● While fantastic in the extreme today, the *airmobile* is no more fantastic than the automobile was in the early reign of Queen Victoria. You have all seen the highly improbable flying platforms recently unveiled by the U. S. Navy. Nor are flying automobiles a novelty. Many have been made and flown successfully. To be sure, a great deal of engineering must take place before every car on our city streets can rise vertically and soar over the rooftops, yet in my opinion, *the future of the automobile is in the air!*

● If the future airmobile is made on the principle of the flying platform, that is, with counter-revolving propellers — which could be small—and could be positioned underneath the car chassis, then the take-off could conceivably be made from the street. The only difficulty here would be the fearful amount of dust raised by the propellers, and the strong winds generated in the vicinity of the car. This might rule such aircars off the streets to the parking lot airport. But evolution marches on, and the *true* airmobile will come later.

In the future—perhaps sooner than we realize—the problem of gravitation that chains us to the planet will have been solved. Einstein, during his lifetime, worked heroically to link gravitation with electromagnetism. Many scientists believe that it will be possible in the future to levitate objects, whether they are cars or spacecraft, in a more efficient manner than we can today. This does not mean, in the favorite science-fiction jargon, that we are going to "neutralize" gravitation, or "nullify" it. You cannot do away with gravitation; *but it will be possible to counteract it.* Rocket or jet propulsion is not, in my opinion, the ultimate answer. But if we can, for instance, create a *counter gravitational field* around, or below, our car of the future, this would solve the problem.

● *In practical terms, this then means that you can levitate the future airmobile at will.* But it requires power to do so, just as your car by itself does not overcome gravitational pull and the resulting friction against the road. It needs an engine and fuel to move.

Likewise, when we succeed—probably by electromagnetic means — in creating a counter gravitational field between the car and the earth, it will take a good deal of power to lift the airmobile. We probably will use atomic energy as the fuel, by that time.

The aircar lifts and rises vertically, first slowly, then faster, till you reach the proper legal height for the air lane you wish to travel on. At the correct elevation, you turn on the horizontal flight power. Either a rear or front—or both—propeller insures level flight. Or, perhaps there will be rear exhausts, *using compressed air,* to push you forward exactly as in today's jet propulsion planes. *All-around radar* will make collisions in the air almost an impossibility.

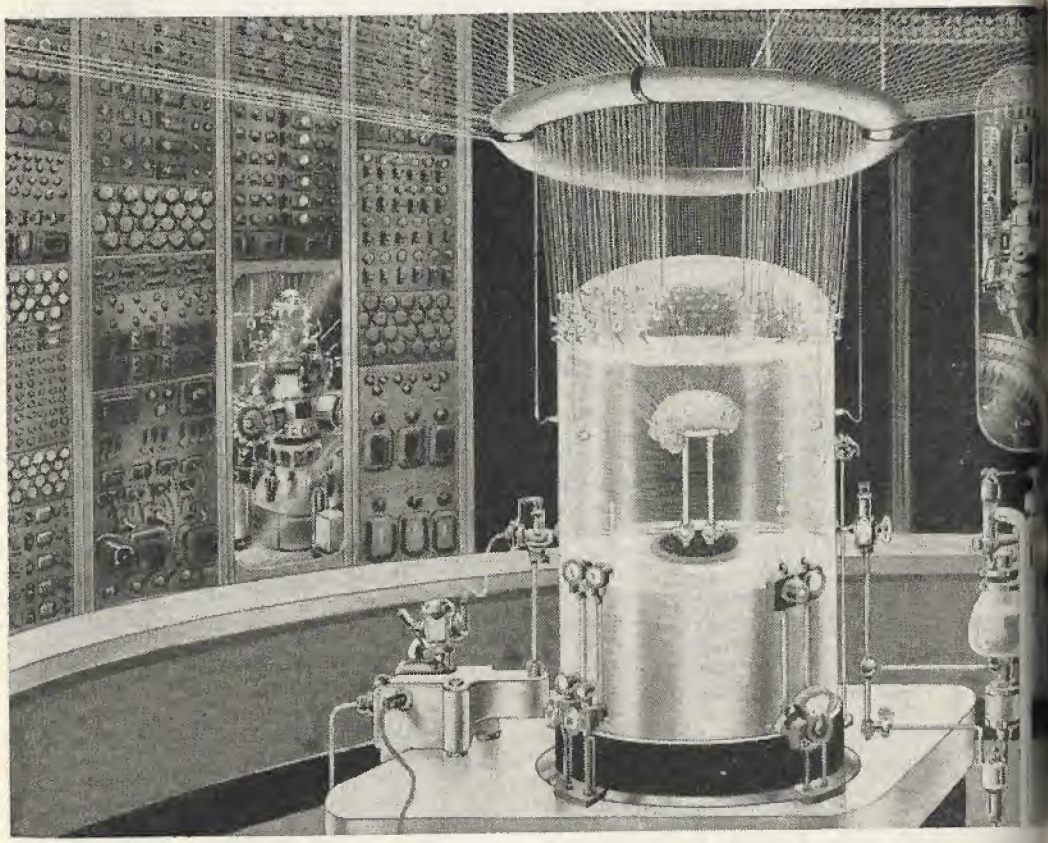
● There will be many aerial lanes, for local traffic, express, and long distance. Speeds will be controlled as with land traffic today. Traffic centers will keep

(Continued on page 31)

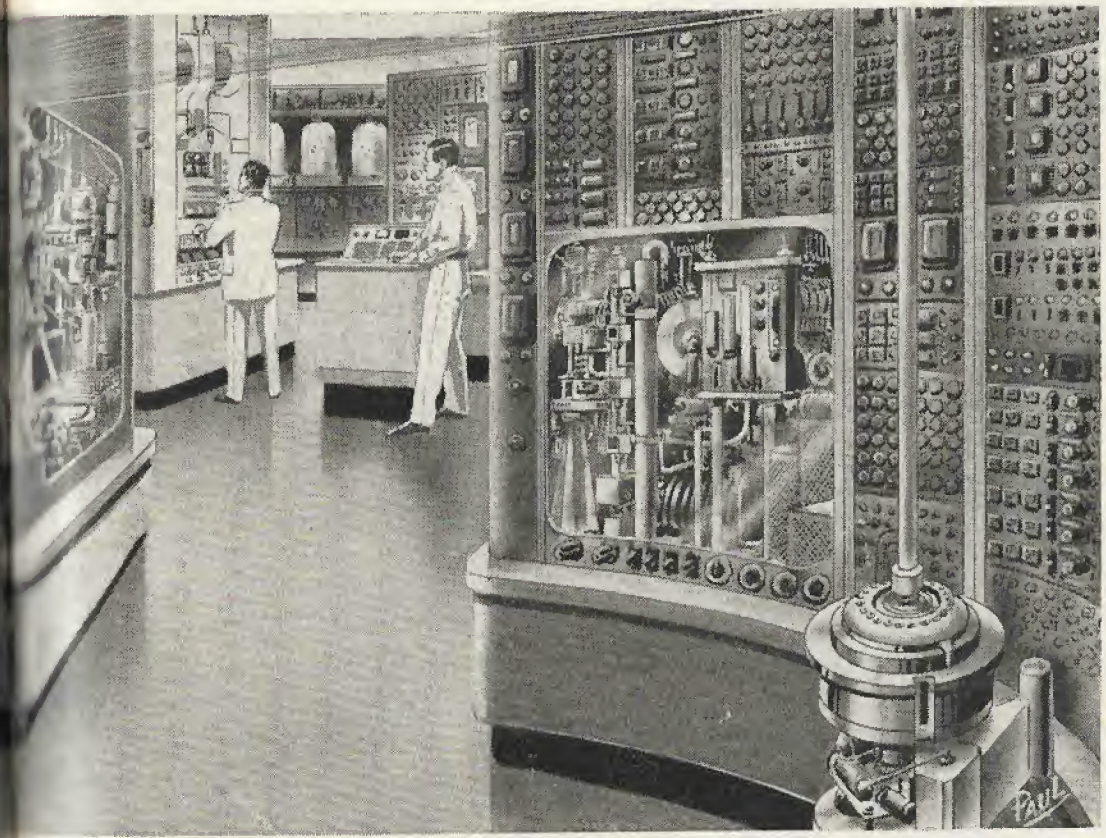
THE ELECTRONICIZED BRAIN

I HAVE always had little patience with those who claim that so-called electronic brains will eventually do away with *constructive* thinking or reasoning. So many people—even academicians—fall into the trap of arguing about whether an electronic brain can think—or reason. Before one can argue successfully on such a subject, one must know *what thinking* or reasoning *is*. No one has ever yet answered this question. We simply do not know. It is the old argument about an equally confused subject: Do animals think? Can they reason?

Many scientists answer in the affirmative, others in the negative. So with electronic machines that solve complex problems. Nevertheless humans, the "lower" animals and electronic brains have many limitations; all work differently under varying conditions. *Yet all must be taught* in some manner. Isolate a dozen



Present-day "electronic brains" cannot think. The electronicized future intellectual brain is grown in a special tank in a vitalizing solution heated to 98.8°. It has its own blood supply. Hundreds of electrodes attached to it work a multitude of machines for industrial or other purposes.



newly born human beings from all human contact by feeding them from simple machines for five years and nearly all of them will grow up mere animals. Without human touch and teaching, you will rear near-idiots.

Bring up insects in isolation and nothing similar will happen. Why? The insect has always been brought up in quasi-isolation. It needs no teaching because *it is a self-contained entity* with a miraculous mechanism: instinct by inheritance. It does not learn as a rule. Rather, it will do the same acts over and over, whether necessary or not, blindly and without reasoning.

● The electronic brain, like the human, must be *taught—it cannot function by itself.* The problems it is to solve must be carefully stated by specialists, usually technicians and mathematicians. This is nearly always done by means of punched cards. *Unless the problem is carefully and precisely stated, the electronic computer cannot function.* Indeed, it can make all sorts of mistakes, if not properly guided. *Only highly intelligent technicians can delineate the problems correctly.* It is, therefore, doubtful that an electronic brain will acquire intellect in the foreseeable future.

Could an electronic brain or the most elaborate computer ever turn out new and important inventions? Could it be an inventor like Edison? Could it make great discoveries like a Faraday, a Nikola Tesla? Could it think up Newton's law of gravitation, Einstein's theory of relativity?

Could it write all of Shakespeare's dramas—or Jules Verne's or H. G. Wells' technical forecasts of the future? Or could it compose Verdi's or Wagner's operas?

● *No, positively no!* No pure *machine* will ever acquire intellect and do these things, at least not for the next thousand years. *Eventually yes,* when we succeed in growing a reasonable facsimile of the human brain in the laboratory—*an actual brain in a tank, equipped with electronic tentacles and means of communication for intercourse with the outside world.*

How do we get such an *Electronicized Brain? We breed it.* We keep it alive for centuries in a special vitalizing broth, just as famed Dr. Alexis Carrel kept a chicken heart alive and growing in a glass tank for decades.

● Such brains would not be *exact* duplicates of present human brains—they would be different in certain respects, inasmuch as their main purpose would be intellectual specialization, for instance, in literature, invention, the arts, physics, etc.

Since such a brain would be completely isolated, it would have to operate a vast array of electronic instruments, computers, magnetic tape recorders, typewriters and dozens of other machines. Hence a specialized human brain will be required for future "industrial" "thinking" machines.

How can such a human brain be "wired" and connected to the vast array of instruments which it is supposed to operate?

● There is no difficulty about that—even today. Indeed, in many instances in the past decade, electroencephalographs have been connected directly to the human brain by means of suitable electrodes. This is done by piercing the skull with a number of small holes. Platinum wires are then inserted into the skull openings which contact the brain in various locations. It is a curious fact that *brain tissue is absolutely insensitive.* It can even be cut by a surgeon without anesthetic—the patient feels no pain whatsoever.

Thus there seems to be no valid reason why future laboratory brains could not be permanently wired, provided proper safeguards have been taken against infection, too great a pressure against the brain by the electrodes, etc.

How do we obtain such brains? In the future—maybe several thousands of years hence—science may have advanced sufficiently so that such brains will actually be "grown" independently of a human body. Just as Dr. Carrell could grow live tissue from small pieces of a former live chicken heart suspended in sterile bouillon, so science may be able to grow human brains.

But long before that, scientists and other altruistic volunteers will have donated their brains to science *before their death.* This will be true particularly of those unselfish men who have incurable diseases.

● It is not possible to utilize the brain after death has set in, particularly if the body has been ravaged by a long illness, such as cancer. Hence steps must be taken to obtain the brain while it is still normal and healthy.

This means special legislation and new medical laws, to allow a board of surgical specialists to secure a living brain that has been willed by its owner to science *prior* to his demise.

Before this time arrives, brains of criminals condemned to death will first be used for such experimental purposes. This will make new medical laws necessary, once it has been proved that isolated living brains are a possibility.

(Continued on page 30)

WHAT IS SEX

THERE exists perhaps no greater confusion in popular nomenclature than the lack of clarity about the word sex. This confusion prevails among scientists as well as laymen. Let us therefore consult only two of many authorities to prove this.

Says the *American Illustrated Medical Dictionary:* "Sex—The fundamental differentiation, found in most species of animals and plants, into those individuals that produce ova and those that produce sperm; the union of these distinctive germ cells being the natural condition for the production of a new individual."

Says *Webster's New International Dictionary:* "One of the two divisions of organisms formed on the distinction of male and female; males and females collectively." This is followed by four additional technical definitions, none of which gives an answer to the question, "What *is* sex?"

Yet all authorities are correct in their definitions, depending upon which sexual facet they concentrate on at the moment.

This is true of every generic term, whether it is electricity, life, magnetism or gravitation. Man still knows so very little about most things in nature that he can talk or think only of the *effects* of the natural forces, not of their true specific origins.

● You may consult the several published sexological volumes of Dr. Alfred C. Kinsey, Havelock Ellis and others, but you will not find a ready answer to "What is sex?" Yes, you will find a vast array of sexological, scientific facts and data in these books which will answer many sexological questions except one.

What is sex? Electricity? Life? Magnetism? Gravitation? *No one knows.* Nor are we likely to know the *true* answers for hundreds of years to come.

I fully agree with Dr. Edwin Stephen Goodrich, M.A., F.R.S., D.Sc., LL.D., Professor of Zoology and Comparative Anatomy at the University of Oxford, when he states flatly: *"The evolutionary history of sex is not yet known."*

An understatement, if there ever was one! He might also have added that we know almost nothing about the real forces of sex. What is sex attraction? What is libido? Sex instinct?

Before we can attempt to answer such questions, we must first know the *origin* of sex and how it all started on our planet. This will be a long and arduous task, not likely to be completed soon by our scientists.

We can attempt here to make some educated guesses, but they can only remain speculations until such time as scientists can produce positive evidence.

● It is almost certain that primordial primitive sex started several billion years ago on this planet. Most likely this occurred in slimy, oozing areas near a body of water. There was no life of any kind as we know it on the planet up to that time. Conditions had to be just right in every respect before life could appear—probably simultaneously—in many regions on Earth. Heat, light, atmospheric conditions—and, more important, chemical prerequisites—had to be balanced correctly before the great phenomenon of life could develop. We know today that the actual basis of life is protein and nucleic acid.

The Kiss. Sculpture by Constantin Brancusi. Louise and Walter Arensberg collection. Philadelphia Museum of Art.

Curiously enough, with all our scientific knowledge and present-day technical skills, we have never been able to create even the lowest forms of life with the two aforementioned sterile and pure chemicals.* Nor are we certain

*Recent research has come close to generating a *virus* type artificially, but we are not certain if the virus is a true form of life.

what the original primordial life-bearing form was. Some scientists guess that it was a vegetable form, but we are not certain. We do know, however, that if the original organism was unable to reproduce its own kind it would have died.

In order to reproduce, an organism *must release a part of itself* which can then grow into a new unit. This can, as we know, be accomplished by *asexual* (nonsexual) reproduction or by true sexual reproduction.

We do not know exactly how long asexual reproduction lasted on our planet before the advent of sexual reproduction, but it is probable that this primitive form existed for millions of years. It still exists. Probably true sexual life, with which we are mostly concerned here, appeared much later.

Sexual reproduction, according to Dr. Goodrich, takes place as the result of the action of special cells of two kinds, set apart and liberated for the purpose, and called *reproductive cells,* germ cells or *gametes.*

● In plants, as in the higher forms of life, there are two kinds of cells adapted to the functions they have to perform. One, the *ovum* or egg, the other the *spermatozoon* of animals or the *spermatozoid* in plants. The organism bearing the ova is female, the one bearing spermatozoa is male.

● We have no clear conception yet as to what physical conditions and which chemicals were involved when the ova and the spermatozoa originally developed. Nor do we know which came first. Most likely neither. Probably at first both were almost alike; then some outside chemical or other force changed the cell structure fundamentally. Eventually, through long evolutionary processes of trial and error, the final male and female cells were evolved. We can therefore postulate: *Sex without life, life without sex are impossible.*

Many hundreds of millions of years later, when life adapted itself into all its myriads of species, the ova and spermatozoa continued to function in the same reproductive cycle. Whether the animals were lizards, like dinosaurs, and laid their eggs as did the fish before them, or whether they were whales of the mammalian genera, which carried their young and nursed them, they all nevertheless sprang from male and female cells.

We now must go back perhaps a billion years to the *original* ovum and spermatozoon and ask a further all-important question: *Why do ova and spermatozoa attract each other so powerfully?* If once we answer this clearly and scientifically, the great sexual riddle will be answered.

● There is abounding scientific evidence that as we ascend in the mammalian scale, the attractive force between male and female generative cells tends to increase.

Indeed, nature wisely interposes numerous obstacles between ovum and spermatozoon so that, despite the great attraction, they should not meet too quickly. Thus the vaginal tract is highly acid, a condition which kills off millions of spermatozoa before they reach the womb on their way to the Fallopian tubes where the final meeting with the ovum usually takes place.

In man, the spermatozoa have to swim, often against gravity, a distance of over 7 inches through tortuous winding passages which are by no means smooth. Consider, too, that the spermatozoon measures only 2/1000 inch, yet it has to propel itself through sticky mucus a distance of 7 inches. On a comparative human scale, this means that a man would have to swim an equivalent difficult course of four miles in thick molasses at the impossible rate of a mile in 17½ minutes to reach his objective.

● Why does nature interpose such a terrific handicap in the fertilization process? As only a single spermatozoon out of 200 million will finally penetrate the female ovum to start a new life, nature sees to it that only the fastest, strongest and most capable male sperm will impregnate the ovum. That is not all. Unless the champion spermatozoon can also supply the important enzyme *hyaluronidase,* it will not be able to pierce the tough outer covering of the female egg. Another better-equipped spermatozoon—the survival of the fittest—will then win the race. This always occurs. Scientists tell us that thousands of sperms will stage a "spermatic storm" around the ovum, with all of them contacting it—*but only one male cell wins.*

After the ovum is penetrated, its outer covering toughens instantly so that no further entering is possible for the other sperms, *all of which perish.*

This brings us back to our question: "Why do ova and spermatozoa attract each other so powerfully *and over relatively long distances?*"

● Dr. Fritz Kahn, physician-scientist-author of the five volume encyclopedic *Das Leben des Menschen* (*The Life of Man*),

thinks that the female ova gives out a very powerful scent which attracts the sperm cells irresistibly. This presupposes that spermatozoa are equipped with a sensory organ which guides them to their distant goal. While not impossible, it has not been proved to the best of our knowledge.

In my opinion most sexual processes are of a purely electrical nature. Biological electricity has been known for nearly 100 years. Muscle and nerve electricity has been studied for a long time and medicine makes use of this knowledge. Large muscles, like the heart in action, generate a constant electric current, which we use in our electrocardiographs to tell us the prevailing condition of the heart. The electroencephalograph detects and records the electric waves generated by the brain.

How do we see? Science tells us that our sight is accomplished by electrochemical means.

Recent studies have shown that a definite electrical potential is generated during a woman's menstrual cycle. The research of Dr. Giles has proved that the electrical potential of some 45 women increased from zero to 15 *millivolts* during menstruation.

Those who have seen electric lamps lit by electric eels know that animal electricity is an important and true biological electrical force. It would seem that life cannot exist without it.

● Slowly we are beginning to realize since the advent of atomics, that vast electrical forces are locked up not only in the atom but in all animal cells which themselves are aggregations of billions of atoms. Only the very crude instruments in use today have prevented us from more thoroughly studying the male and female generative cells. It appears quite certain that the spermatozoa and the ova generate electrical currents or waves. If this is true, the attraction between them is easier to understand.

● Some of our animal sensory organs are so attenuated that they defy all present-day laboratory test instruments. Thus we can smell the faintest odors—dogs in this respect can do much better—but we have no efficient "smell" instruments. We can taste hundreds of different flavors, but we have no laboratory testing instrument that will tell us instantly that the drop of liquid under test is Bernaise sauce. Indeed, the human tongue can "taste" minute electrical currents, as everyone who has some new metal fillings in his mouth knows. Yet the electrical potential is so low that it takes a good electronic millivoltmeter to read the minute voltage.

When it comes to tiny electric wave motions such as those generated by the brain, we were not even aware of them 30 years ago until the advent of the electroencephalograph.

● This brings us to the so-called "attraction between the sexes" and "magnetic personalities." What does all this mean? Can we sense a difference in electrical potential as, for instance, many animals can sense an electric potential over a distance? What passes between a man and a woman when they first shake hands which causes many women to say that they experience a distinct "tingling?" It is not at all impossible to postulate that we have a delicate sensory mechanism by means of which we can detect biological electric currents or electric wave motions. These may vary in intensity, frequency or pulsation in the opposite sex, making easy detection possible if the subject is properly "attuned" or "compatible."

This would in turn explain the physical attraction between the sexes, particularly when they contact each other, as in kissing, etc. We stated before that practically all sexological processes are electrical in nature. This also includes the human orgasm, which has been investigated by many scientists, although not sufficiently.

Perhaps in the not-too-distant future a team of physicist-scientists will develop a hypersensitive instrumentality which will make a tape recording of a male-female handshake, or a passionate kiss. The future electronic apparatus —let us call it an *electromicroperceptor*—will give us graphic curves *in intensity* of the couples being tested. It is probable that some couples will register comparatively weak graphs while others with greater mutual libido will give us entirely different tracings. These recordings will help marriage counselors and others immensely in judging, for instance, compatibility between couples. It will help science in many respects to lift the ancient curse of the "lottery aspect" of marriage.

● Meanwhile, until a great deal of further research has been done, on the basis of the existing evidence we can give a preliminary answer to the question "What is sex?" *Sex is a complex electrical phenomenon.*

EXTRA SENSORY PERFECTION

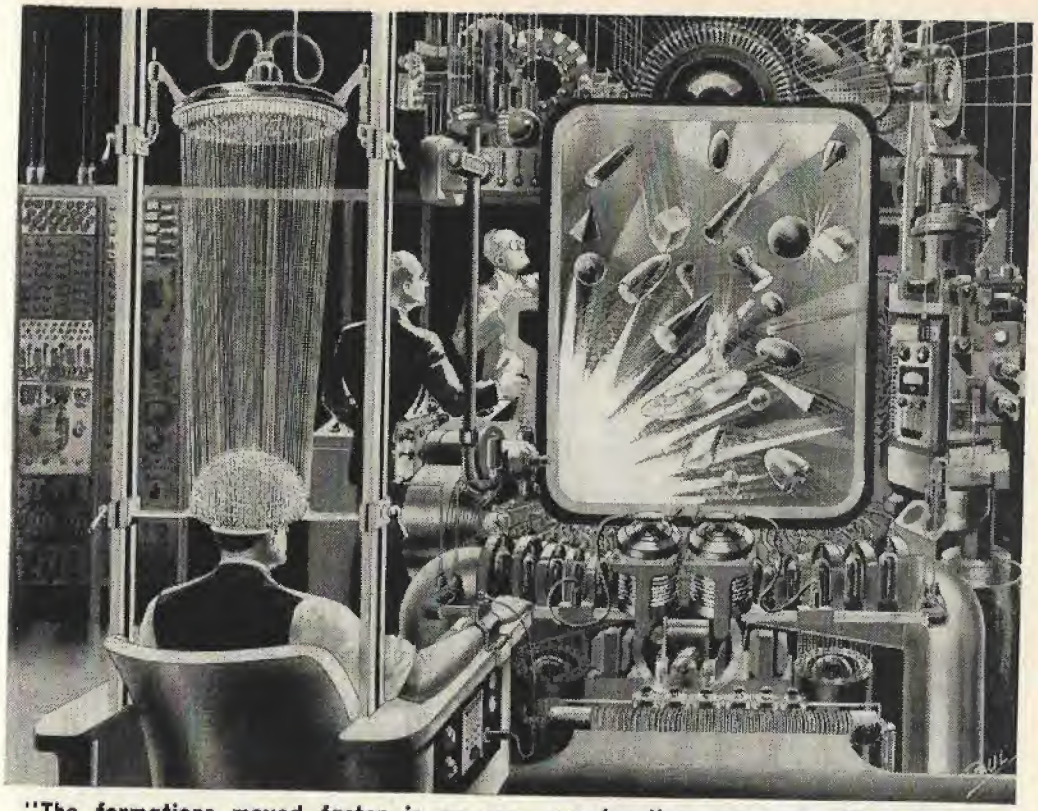
DEAR Maddy:

I received your Paris letter today. Naturally I am deeply touched that your old father should be the cause of so much concern to you, and once again I am amazed at your keen psychic and divining powers. How could you possibly guess that I was confined in a hospital? *C'est formidable!* Well, I might as well confess, you hit the bullseye this time. So let's start from the beginning.

● For some time, queer things have been going on inside the front part of my cranium. There were vague pressures, shooting sensations, short pin-pricks—like tiny electric shocks. This was very disturbing. I saw three of my doctors, Dr. Schwartz, Dr. Benjamin, and Dr. Baylek, but none could diagnose my illness. Then suddenly the condition became aggravated; a fantastic array of color shapes and patterns often appeared before my eyes. They shifted rapidly, but I could not focus on them. It was a most disconcerting and weird experience. Naturally, I went to see our Cousin, Dr. Pi, and he gave me a thorough eye examination —but he, too, found nothing whatsoever. He thought the trouble might be psychic, and strongly advised me to go to the *Manhattan Neurological Center* on Park Avenue for observation and a ten-day check-up.

While I was hospitalized, I had eons of time on my hands —they did not even allow me to read. My thoughts logically turned to you and I marveled— as I have often done in the past —at your psychic powers, particularly your *E.S.P.* — Extra Sensory Perception.

● I readily agree with Dr. J. B. Rhine of Duke University on the existence of E.S.P. I have long had my own explanation of its *modus operandi.* I think it can be explained by purely physical means, and I, for one, am convinced that there is nothing so very mysterious about it.



"The formations moved faster in an ever accelerating crescendo. They became far more brilliant and exciting, clawing, tearing at each other, often clashing in astounding collisions. I was now breathing in torment, my heart beating violently."

Science has given us abundant proof, through the *electroencephalograph* and other instruments, that the human brain in reality is an electric generator. It generates electric waves constantly, day and night—while we are awake or asleep. But just as an electric generator can also be reversed and become a receiver, a motor, so the brain, under certain conditions, can become a receiver of electromagnetic waves. For example, carrier pigeons and other birds when flying near a broadcast station, can no longer orient themselves; they become confused by the action of the radio waves on their brains.

● Thus when your brain in Paris becomes exactly tuned to mine because of anxiety—and begins to transmit certain radiations, I, in New York, 3600 miles distant, receive these waves in .019 of a second (19.3 milliseconds).

This phenomenon somewhat

parallels the process used by a radio amateur, who, with a few watts coaxed from three dry cells, sends intelligible signals halfway around the Earth. To be sure, whether they are brain transmissions or radio transmissions, the distant receivers will *not* intercept them unless correctly attuned to the proper wavelength. So much for E.S.P.—I thought you would be interested in my rather mechanistic views on the subject.

But, *revenons à nos moutons* —let's get back to our chickens, or, rather, to me in the hospital on my bed of doubts.

● Fortunately, the *Manhattan Neurological Center* had just the scientific equipment needed to unravel my rather unusual case, as it turned out. Next day, I met the very able and highly academic Professor Utis Moselle, the head man of M.N.C. His penetrating, almost hypnotic eyes seemed to search the farthest reaches of my brain, and his questioning was super-intelligent. He has a trick of worming his way into your inner psyche—if you have one—that's amazing.

In short order he had me wheeled into the most modern, electronic-biological research laboratory I had ever seen. Accustomed, as you know I am, to such equipment, this array of instrumentation, much of it unfamiliar, filled me with ecstatic satisfaction and confidence. I immediately sensed that if anyone could cut my particular Gordian brain knot, Prof. Moselle and his electron-gadgets would.

First I had the routine tests on the *electroencephalograph* and the *electropsychometer*, followed by tests on a new version of a *multiplex polygraph*. Then part of the back of my head was shaved and a metal rig was attached to me with connections going to the front and the back of my cranium. Now a series of tests were made to ascertain my receptivity for short waves and ultra short waves via a *resonating oscillograph*. My reception index seemed above average.

● Yet I could sense that Prof. Moselle was still puzzled about my condition, and he suggested a further test. I could not follow this one, as I had been given a new type of electronic anesthetic which completely numbed my senses via the spinal column. This rather new anesthetic makes use of a special sinusoidal, oscillatory high-frequency current which constantly varies in intensity, numbing most of the patient's neurons and consequently sensory powers.

When I came to, I noted an intense gleam in Moselle's eyes. "Well," said he, "we've plumbed your depths—we're on the right track! And now for your real, and I hope, final examination."

I was taken into an adjoining darkened and soundproofed room. It contained a simple huge piece of apparatus, six feet on all sides, with a screen four by five feet in dimension. Several technicians were busy with meters and various instruments built into its base. I was seated in front of the machine's screen. Immediately the three technicians wired me to several outlets. First my hair was wetted, then a huge helmet containing hundreds of polished probes was placed over my head. These probes were set into metal tubes which had spring adjustments. Every probe thus adjusted itself to the contours of the human head, making an excellent contact with the scalp as the springs push the probes downward. Each probe had a separate wire connecting it to the huge machine.

● "This," boomed Prof. Moselle, "is my latest psychic explorator, which has been named by my co-workers the *Moselle Psychoencephanalyzer*, called PEA for short. When activated by your brain, it throws various patterns on the screen, *not only in full color,* but in all metallic hues as well, such as silver, copper, gold, etc. The machine also records the entire action so we can preserve each patient's recorded psycho-brain analysis for later study, if this be necessary.

● "Now, before we start, I might state that your preceding tests have shown that *you are under an unusual psychic strain.* It seems that you have built up what we term a number *2F Neuropressure.* It is our hope that we can puncture this pressure and reduce it to zero. Once we achieve this, you will return to normalcy."

By this time the technicians had also wired both my hands with a wire leading to a button held by Prof. Moselle.

"Ready!" sang out the Chief Assistant, followed by Moselle's "Go!"

● Immediately weird surrealistic patterns in myriad colors sprang to life on the screen as I sat watching, spellbound. There were globes and spheres of all sizes, rods, tetrahedrons, whirling circles, weird crystal formations in fascinating arrays. They intermingled in coruscating, glittering cadenzas that flashed and scintillated in breathtaking fashion. Often the shapes and patterns glowed in quite unearthly phos-

phorescence against black and purple backgrounds, only to instantly switch into pulsating life-like metallic cascading, shimmering sprays.

As I watched the screen, I became aware of a constantly increasing tempo. Now the shapes and formations moved faster in an ever-accelerating crescendo. The forms became far more brilliant and exciting, clawing, tearing at each other, often clashing in astounding collisions. I was now breathing in torment, my heart beating violently.

● Then suddenly an electrifying shock ran through my system—an intense, blinding silver-white fluorescent star burst in the midst of a riotous color Bacchanalia on the screen, and I blacked out.

* * * * * *

I came to in a daze, feeling strangely exhilarated. Professor Moselle was smiling pleasantly and his voice had a quality of triumph in it.

● "What you just witnessed," he began, in his odd lecturing manner, "was the culmination of something that had been going on in your subconscious for several weeks. But it couldn't come to the surface, despite all your laboring. So at the very end of the test I gave you a *psycho-electric* shock treatment that released the pressure from your psyche.

● "I call it a *psychic caesarean operation*—THE BIRTH OF AN IDEA! What, if I may ask, really *was* this bothersome idea?"

"That," I replied, still somewhat shaky, "is simple—it was the idea of this story!"

Your now fully recuperated and loving,

Father.

THE ELECTRONICIZED BRAIN

(Continued from page 19)

How is the brain kept alive? Probably the most important consideration is the blood supply. Without it, the brain must die. Therefore, *before* isolation, it must be provided with a blood supply. This is not too difficult, even today. The correct blood type can be pumped through the brain's venous channels to keep it alive and functioning indefinitely. There are a number of other factors, such as the circulation of the cerebrospinal fluid which must be maintained.

I cannot see any insurmountable difficulties in the future development of techniques to keep an isolated brain alive. I am certain they will all be mastered.

FUTURE TRANSPORTATION

(Continued from page 15)

you informed on traffic density at all times via radio, so that you will not enter or travel in congested air lanes.

● The aircar will be provided with short stabilizing ailerons and a tail—both of which, for land-cruising, *retract into the body of the car*. Made of aluminum alloy or other strong metal, they can be thin, taking up a minimum of space.

At the end of our outing, we descend to the street, garage, or parking lot, simply by reversing the ascending operation; that is, decreasing the counter gravitational field. Soon we contact the earth once more.

● As air travel is ever so much faster than surface travel, it becomes much more practical to park your aircar beyond the city limits and so decongest cities and eliminate the present parked-car nuisance. A radio call to your city garage before you land will dispatch an attendant who will be waiting at your address. He will either fly your aircar to the city parking lot or, if that is full, he will fly it beyond the city limits, to a municipal parking lot, in a matter of minutes. He will deliver the car to you the next day or at any requested time.

● The cost of an aircar? Probably not more than today's automobile. The reason is that there will be no expensive gasoline engine, such as we use today. Instead, we will utilize one or two much cheaper electric motors to drive the car.

● I have maintained for many years that atomic energy is in the main *electrical*. Today we foolishly use only the atom's thermal—its heat—energy. The dangerous radiation—which is chiefly electrical in nature—we now waste by cumbersome shielding. Once we learn how to use this now dangerous radiation energy, the way will be open to universal cheap atomic power. All this is not a theoretical wild dream—atomic batteries, which generate electricity *directly from the atom*, are now being made by a number of concerns. The power is miniscule, but so was that from Volta's first electric battery in 1800. From it sprang our vast electrical age.

● *Atom-electrical energy* will surely be the prime moving power in our future transportation.

Above: Silver plaque award. Translation of inscription: HELIOS—Non-Profit Organization. To Hugo Gernsback, Pioneer in Sexual Education.

LAST year the Editor and Publisher of SEXOLOGY magazine was honored by the *Helios,* Belgian Society, which every five years makes special awards to persons who have devoted their life work to the dissemination of sexological education. Awards were made in the past to Professor Havelock Ellis, Dr. Sigmund Freud and others. A translation of the citation follows:

HELIOS Non-profit Association for the Advancement of Family and Social Relations.

To Whom It May Concern:

WHEREAS, because of a custom which has become a tradition, HELIOS, on the occasion of each quinquennial jubilee, honors a pioneer in the field of ideas to which it is consecrated;

WHEREAS, on the motion of Professor Marc Lanval, President of the Organization, made at the meeting held on October 2, 1954, there was unanimous agreement as to the laureate to be so honored:

HUGO GERNSBACK

editor-author, of 25 West Broadway, New York, U. S. A.; and—

WHEREAS, at a plenary assembly of the members of the Organization, held on October 21, 1954, this choice was ratified by acclamation; it was

RESOLVED that the Administrative Council, the supreme body of HELIOS, confer upon HUGO GERNSBACK, as above mentioned, the title of *Honorary Life Member* of this Organization and present him with the Silver Jubilee Trophy of 1954, comprising a plaque and jewel which has been transmitted to him through the good offices of the Diplomatic and Cultural Service of the *United States Embassy* at Brussels, to whose care this Trophy has already been entrusted.

The present serves as Diploma and Certificate.

Dated: Brussels November 4, 1954. Administrative Council. By: **Marc Lanval** (L.S.), President. By: Jul. Swenne-Bollekens (L.S.), Sec'y-Treas.

HELIOS, *Mouvement d'Éducation Sociale & Familiale*

ASSOCIATION SANS BUT LUCRATIF

À TOUS ceux que la chose concerne

Considérant qu'une heureuse habitude qui devient tradition, veut que HELIOS, à chaque jubilé quinquennal, honore un pionnier des idées qui sont sa raison d'être ...

Considérant que, sur la proposition de son président, le Prof. Marc Lanval, lors de sa séance du 2 octobre 1954 l'unanimité s'est faite sur le nom du lauréat:

HUGO GERNSBACK

éditeur-auteur, 25, West Broadway, New-York 7, Etats-Unis...

Considérant que l'Assemblée Plénière des membres de l'association réunis à Bruxelles le 21 octobre 1954 a ratifié ce choix par acclamations;

Le Conseil d'Administration de HELIOS, pouvoir suprême de l'association, confère à Monsieur Hugo Gernsback, comme dit ci-dessus, le titre de Membre d'Honneur à vie de l'association et lui attribue le Trophée Jubilaire 1954, en argent, dont la plaquette et le bijou lui seront remis par les bons soins des services diplomatiques et culturels de l'Ambassade des Etats-Unis à Bruxelles, qui les ont pris en charge.

La présente tiendra lieu de diplôme et de brevet.

Fait à Bruxelles, le 4 novembre 1954.

pour le Conseil d'Administration,

le secrétaire-trésorière, le Président,

MOUVEMENT D'ÉDUCATION SOCIALE & FAMILIALE
HELIOS
ASSOCIATION SANS BUT LUCRATIF
1924

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